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EFFECT OF COMPUTER-ASSISTED INSTRUCTION ON THE PERFORMANCE OF LIBRARY AND INFORMATION SCIENCE UNDERGRADUATES IN DELTA STATE UNIVERSITY, ABRAKA

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Abstract

This study investigated the effect of computer-assisted instruction on the performance of Library and Information Science undergraduates in Delta State University, Abraka. The study adopted a pretest-posttest control group quasi-experimental non-randomised research design. The population of the study comprised 467 undergraduates in the Department of Library and Information Science, Delta State University, Abraka. A total of132 students participated in the study. The instrument used for the study is a multiple-choice achievement test in LIS302 (Technical Services Division). The statistics that were used are mean, standard deviation, t-test and Analysis of Covariance (ANCOVA) at 0.05 level of significance. The findings revealed that there is a significant difference in the pre and post-test scores of students taught using computer-assisted instruction; that there is a significant difference in the post-test scores of students taught using computer-assisted instruction and those taught using traditional lecture method, and that there is no interaction effect between sex and teaching method in the post-test scores of students. Based on these findings, the researcher recommended amongst others that, Library and Information Science lecturers should adopt the use of computer-assisted instruction in the teaching of Library and Information Science so as to improve the overall academic performance of the students.

Keywords: Computer-Assisted Instruction; Academic Performance; Library and Information Science; Undergraduates.

Introduction

Library and Information Science (LIS) is a course designed to train professionals for the provision of quality services in an information-based environment. With the emergence of Information and Communication Technologies (ICTs), the information services activities have changed. This has affected the way services are delivered, especially with the collapse of the world into a global village. In the area of LIS, information can be rendered and obtained from anywhere in the world without physical contacts. The average librarian need not be in contact with a potential library user before he/she can provide quality information services. Information can now be delivered to people via broadband networks.LIS Education is, therefore, expected to train individuals to be relevant, dynamic, service-oriented and responsive to the gradual and drastic changes taking place in the information sector globally (Akwang, 2017).

Given the above, there is a need to apply an appropriate teaching method which will not only facilitate the acquisition of new knowledge and skills but will also improve the performance of trainees. Several teaching methods are used by LIS lecturers in the classroom environment. One of such methods is the conventional method of lecturing. The lecture method is a common method used in the classroom for the teaching of LIS. This method is also referred to as discussion method and talk-and-chalk or textbook method. This method focuses on the teacher, which implies that the main actor of the lesson is the teacher, while the learners are passive listeners. During the use of the method, the teacher dominates the teaching with very little participation from the learners. Here, the teacher is considered to be the repository of all knowledge while the students are passive recipients of the knowledge transmitted by the teachers. At the end of the lesson, the learner can ask questions or be required to answer certain questions, make comments or write down points.

The lecture method has the advantage of covering a larger area in a short time. However, it has several weaknesses. For example, it is characterized by a focus on teacher behaviour rather than student behaviour, minimal student response to instructional materials, and lagging feedback on students' performance. Essentially, the teaching method is considered obsolete; a heavy burden with little impact on the development of the child's learning. According to Ughamadu (2006), this method is a clear negation of the accepted view that learning is an active rather than a passive process. Ololobou (2009) confirmed the weakness of the lecture method when he identified persistent use of the lecture method as one of the major deficiencies affecting higher learning and performance in the humanities.

Given these weaknesses, it is, therefore, necessary to advocate the use of other appropriate methods for the teaching and learning of Library and Information Science. Various teaching methods abound. However, the researcher is interested in the use of Computer-Assisted Instruction (CAI).

CAI, as used in this study, is a term used to describe the use of computers to provide instruction directly to students, with the use of several telecommunication gadgets such as laptops, projectors, projector slides and PowerPoint presentation. It is an instructional programme presented through a computer or computer system. Moore (as cited in Fakomogbon, Adetayo, Oyebode&Enuwa, 2014) referred to CAI as educational material for instruction and remediation presented on a computer. The potential benefits of CAI cannot be underestimated in the contemporary world. There are a plethora of established findings on the instructional value of the computer, particularly in advanced countries. The current trend in research all over the world is the use of computer facilities and resources to enhance students' learning. This is because, students learn instructional contents faster, and retain what they have learned better with CAI than with conventional lecture method.

Researchers have studied the effectiveness of CAI in teaching and learning. For instance,Ige and Hlalele (2017) found in their study that students exposed to Computer-aided teaching programme had higher adjusted achievement mean score than their counterparts exposed to the conventional teaching method. Furthermore, in a study of Nwaubani, Okafor and Onyeanusi (2014), they found that teachers perceived CAI to be effective in teaching. In explaining the potential benefits of computer-assisted instruction in the teaching and learning of Library and Information Science, Kumbhar (2009) noted that computer-assisted instruction will benefit LIS instruction due to its aid in change management, increased expectations from employers as well as users, multi-skilled personnel, job-specific needs, image of the profession, more content and short duration, changing learning trends as well as distance education and e-learning. ICT permeates almost all the courses taught in Library Schools.

In another field, Adedamola (2015) investigated the effects of the introduction of Computer-Assisted Instruction (CAI) in biology compared to the traditional method of teaching on senior secondary school students' achievement and attitude. A science class was randomly selected in each of the three purposively selected schools. One hundred and fifty-two students participated in the study. One-group pretest-posttest experimental design was used. Students' pre- and posttest examination scores were used to assess the effect of the instruction. Students' Attitude to Computer Instruction Questionnaire (SACAIQ) with reliability (r) = 0.78 was used to assess students' attitude towards Computer-Assisted Instruction. Data collected were analysed using descriptive and inferential statistics. The result of the study revealed that a statistically significant difference existed between students' academic achievement and mode of instruction but no significant difference existed in the students' attitude.

Sedega, Mishiwo, Fletcher and Kofi (2017) investigated the effect of CAI as a method on the academic achievement of senior high school (SHS) students in the subject area of

mathematics. The sampled classes were assigned to two groups based on their achievement scores in the pre-test. Two different treatments were applied during the study. The experimental group received instruction via CAI with the researcher as a facilitator while the control group was taught by the researcher using the conventional approach. Both groups took an achievement test just after the treatment was over to determine the treatment effect. Analysis of data revealed that both the CAI and the traditional approach have led to increases in students' performance in the teaching and learning of Pie Chart and Histogram in Core Mathematics but the CAI approach has led to much gain in terms of students' achievement than the traditional approach in the teaching and learning of Pie Chart and Histogram in Core Mathematics.

The above reviews have shown that various studies have been conducted on the effect of computer-assisted instruction on student achievement in various subjects. It has been observed in the literature that indeed; CAI is very effective in improving students' achievement. The researcher observed, however, that no study had been conducted on the use of computer-assisted instruction to improve students' educational outcomes in the field of Library and Information Science. It was also observed that none of the studies reviewed was conducted in Delta State. All of these factors have created a serious gap in the literature, which this study aims to fill.Hence, the purpose of this study is to investigate the effect of computer-assisted instruction in teaching and learning of Library and Information Science on the performance of undergraduates.

Hypotheses

The following null hypotheses were tested at an alpha level of .05:

$H_0$1: There is no significant difference in the pre and post-test scores of LIS undergraduates taught using computer-assisted instruction

$H_0$2: There is no significant difference in the post-test scores of LIS undergraduates taught using computer-assisted instruction and those taught using traditional lecture method

$H_0$3: There is no significant interaction effect between gender and teaching method in the post-test scores of LIS undergraduates.

Materials and Method

The study employed the pretest-posttest control group quasi-experimental non-randomised research design. The study made use of experimental and control groups. The experimental group was taught using computer-assisted instruction while the control group was taught using the lecture method. The population of the study comprised 132third-year undergraduates in the Department of Library and Information Science, Delta State University, Abraka. All the students participated in the study since it was an intact class.

The research instrument used for the study is an achievement test in LIS302 course (Technical Services Division), which covered the course outline for the course. It contained 50 multiple-choice objective questions.There were two intervening packages for the study which included lecture method lesson plan and computer-assisted instruction lesson plan. These lesson plans were prepared by the researcher.

The face and content validity of the instrument was done by three experts in the field of Library and Information Science. The test was prepared by the researcher and given to the experts who were requested to go through to determine if the face and content validities of the instrument were appropriate. Based on their constructive criticism and useful suggestions, necessary corrections of the instrument were made and effected.

To determine the reliability of the instrument, it was administered to thirty (30) LIS undergraduatesatthe Ambrose AlliUniversity, Ekpoma,Edo State. These undergraduates were

not part of the sample of the study but from the same population. The data were subjected to statistical analysis using KR_{20} and a coefficient of 0.96 was obtained.

A pre-test was conducted on both the experimental and control groups using the achievement test designed for the study. Thereafter, the researchertaught the students in the experimental and control groups using the computer-assisted instruction and lecture method respectively. Treatment lasted for six weeks, after which the post-test was conducted in both the experimental and control groups. The post-test questions were the same as the pre-test but the questions were re-arranged.

The statistics that were used are mean, standard deviation, t-test and Analysis of Covariance (ANCOVA).at.05 level of significance.

Results

$H_0$1: There is no significant difference in the pre and post-test scores of LIS undergraduates taught using computer-assisted instruction

Table 1: T-test analysis of the difference in the pre and post-test scores of LIS undergraduates taught using computer-assisted instruction

Scores	*n*	Mean	*SD*	*t*	*P*	Decision
Pre-Test Scores	66	31.58	6.13	97.05	.000	Significant
Post-Test Scores	66	62.21	7.86			

Table 1 shows a paired samples t-test, which was conducted to test the difference in the pre and post-test scores of LIS undergraduatestaught using computer-assisted instruction. The result shows that the p-value is less than .05 level of significance (t=97.05, p<.05). The null hypothesis is therefore rejected. This means that there is a significant difference in the pre and post-test scores of LIS undergraduates taught using computer-assisted instruction.

$H_0$2: There is no significant difference in the post-test scores of LIS undergraduates taught using computer-assisted instruction and those taught using traditional lecture method

Table 2: T-test analysis of the difference in the post-test scores of LIS undergraduates taught using computer-assisted instruction and those taught using traditional lecture method

Teaching Method	***n***	**Mean**	***SD***	***t***	***P***	**Decision**
Computer-Assisted Instruction	66	62.21	7.86	24.67	.000	Significant
Lecture Method	66	39.39	6.18			

Table 2 shows an analysis of the difference in the post-test scores of LIS undergraduates taught using computer-assisted instruction and those taught using traditional lecture method. From the result, the *p*-value is less than .05 level of significance. Hence, the null hypothesis is rejected. This means that there is a significant difference in the post-test scores of LIS undergraduates taught using computer-assisted instruction and those taught using traditional lecture method, in favour of those taught using computer-assisted instruction.

$H_0$3: There is no significant interaction effect between gender and teaching method in the post-test scores of LIS undergraduates.

Table 3: ANCOVA analysis of the interaction effect between gender and teaching method in the post-test scores of LIS undergraduates

Tests of Between-Subjects Effects

Dependent Variable: Post-Test Biology Scores

Source	**Type III Sum of Squares**	***df***	**Mean Square**	***F***	**Sig.**	**Partial Eta Squared**
Corrected Model	36617.512[a]	4	9154.378	386.065	.000	.871
Intercept	4821.053	1	4821.053	203.317	.000	.470
Pre-Test	5587.101	1	5587.101	235.623	.000	.507
Teaching Method	29324.749	1	29324.749	1236.705	.000	.844
Metacognition	290.636	1	290.636	12.257	.001	.051
Teaching Method * Gender	**9.387**	**1**	**9.387**	**.396**	**.530**	**.002**
Error	5430.048	127	23.712			
Total	645897.000	132				

Corrected Total	42047.560	131				

a. R Squared = .871 (Adjusted R Squared = .869)

Table 3 shows a Two-Way Analysis of Covariance (ANCOVA), which was conducted to assess the interaction effect between gender and teaching method in the post-test scores of LIS undergraduates. Pre-test scores of the undergraduates were used as the covariance to control for individual differences. There is no interaction effect between gender and teaching method in the post-test scores of students ($F = 0.40$, $p > .05$). Since the p-value is greater than .05, the null hypothesis is hereby accepted. This means that there is no interaction effect between gender and teaching method in the post-test scores of LIS undergraduates.

Discussion

This study examined the effects of computer-assisted instruction on the performance of LIS undergraduates in Delta State University, Abraka. The result of data analysis revealed that a significant difference exists between the pre and post-test scores of LIS undergraduates taught using computer-assisted instruction; and in the post-test scores of the students taught using computer-assisted instruction and those taught using traditional lecture method, in favour of those taught using computer-assisted instruction. These findings suggest that computer-assisted instruction was able to improve the performance of undergraduates in Library and Information Science. This is a confirmation of the researcher's earlier hypothesis that computer-assisted instruction is a more effective teaching method than the conventional lecture method. This is because, in an era of rapid technological development and the proliferation of information and communication technology in all spheres of human endeavour, the place of computer in teaching and learning cannot be over-emphasised.

The study also found that no interaction effect exists between gender and methods in the post-test scores of the students. This finding suggests that computer-assisted instruction is effective for both male and female students; as such it does not discriminate between them on its effectiveness in teaching and learning. The implication is that both male and female students are likely to benefit from a computer-assisted instruction without prejudice to gender variations. The findings of this study confirmed the results of earlier findings by various studies (Adedamola, 2015; Ige&Hlalele, 2017; Sedega, et al., 2017). The result of the studies carried out by these researchers independently suggests that CAI is an effective method of instruction, which have led to an improvement in students' performance in various subject areas.

Conclusion and Recommendations

Based on the findings of this study, it was concluded that computer-assisted instruction is an effective method of instruction, which will benefit both male and female students alike. In line with this conclusion, it is therefore recommended that Library and Information Science lecturers should adopt the use of computer-assisted instruction in the teaching of Library and Information Science. Furthermore, management of Library Schools should endeavour to acquire ICT facilities, so that such can be integrated into the teaching and learning of Library and Information Science courses.

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